

FUTURE LABS:

PROPOSALS FROM WORKERS FOR A JUST ENERGY TRANSITION

METALWORKERS



1ST EDITION

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FUTURE LABS

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INTRODUCTION

FUTURES LABS: BUILDING JUST TRANSITION POLICIES IN BRAZIL BY LISTENING TO UNIONS

Brazil is on a path of global transformation where the connection between labor and climate is a central element for advancing towards a Just Energy Transition. From May to November 2025, Aurora Lab conducted the *Caravana do Futuro*, which was guided by this theme. The *Caravana* sought to connect territories, amplify voices, and develop new possible futures that incorporate climate justice, a just transition, and decent work.

In this context, the Futures Labs are an initiative that seeks to contribute to strengthening the Just Transition. This material aims to translate the demands of workers, developed during the Labs, into concrete public policy proposals that can contribute to domestic and international debate.

THE INITIATIVE AND ACTORS INVOLVED

The Futures Labs were conducted by Aurora Lab in strategic partnership with relevant and representative unions in this discussion, including the ABC Metalworkers' Union, the Unified Federation of Oil Workers (Federação Única dos Petroleiros - FUP), the Northeast Regional Federation of Urban Workers (Federação Regional dos Urbanitários dos Nordeste - FRUNE), and the Unified Confederation of Urban Workers (Confederação Nacional dos Urbanitários - CNU).

The main objective of this initiative is twofold: first, to create spaces for listening and dialogue on workers' concerns, demands, and pro-

posed solutions; and second, to contribute to the development of concrete proposals for a just transition.

The methodology used was created in partnership with Instituto Procomun, based on their Citizens' Labs, and adapted to the Unions' context, allowing workers to draw on their vast experience in defending labor rights to propose pathways that ensure a truly just energy transition.

THE CO-CREATION PROCESS AND THE SECTORS COVERED

Over the course of three months, the Futures Labs mobilized approximately **120 workers and union leaders to co-create proposals for a Just Transition**. The discussions focused on three sectors crucial to Brazilian decarbonization: **oil and gas, automakers/transportation, and power generation**, with a particular focus on renewable energy.

The co-creation meetings took place in São Bernardo do Campo (São Paulo), Rio de Janeiro (Rio de Janeiro), Salvador (Bahia), and Mosso-ró (Rio Grande do Norte). To enrich the landscape and connect key areas for climate action, the initiative also invited experts from the climate and labor fields to provide reflections on the challenges and possibilities for advancing mechanisms that guarantee climate justice and decent work.

DIFFERENT SECTORS, DIFFERENT CHALLENGES FOR THE ENERGY TRANSITION

The debates held in different regions and sectors revealed concerns expressed across the board: the risk of job losses, the need to (re)skill entire sectors of the workforce to face the transition, and the need

for legal frameworks that guarantee rights throughout the process.

At the same time, each sector faces unique realities regarding the pace of the transition. **Renewable energy workers**, for example, are already experiencing the impacts of a transition that is advancing at an accelerated and unplanned pace, and that has failed to incorporate issues related to labor rights and job quality adequately.

Metalworking sector also face impacts in the near future. With the advancement of transportation electrification, Brazil faces significant risks if it fails to implement measures to position itself in a market dominated by foreign technologies and markets. Beyond a debate about jobs, this will also need to be a debate about industry and its role in decarbonization.

Finally, the reality of **oil workers'** demands necessitates a comprehensive and planned transformation in the medium and long term, preparing the sector for the necessary transition away from fossil fuels as soon as possible, without losing sight of energy sovereignty and the role of the State.

20 PROPOSALS FOR A JUST TRANSITION AGENDA

The most tangible and immediate result of the Futures Labs was the development of 20 public policy proposals. These proposals were formulated based on the specific realities and concerns of each sector and are compiled into three sectoral notebooks that summarize the discussions held. In addition to these proposals, each sector also developed others aimed at strengthening its labor union involvement on the energy transition agenda.

The initiatives presented here offer an initial translation for decision-makers and policymakers of what a Just Energy Transition might look like in practice. Because they are grounded in workers' experien-

ces, the proposals ensure that policies are grounded in reality and provide safeguards for those directly impacted by the processes of building a low-carbon economy.

This publication also includes the perspectives of labor unions and climate and labor experts to provide context on the issues. More than a record, this publication is an invitation to dialogue and action.

May these pages inspire reflection, strengthen collaborative networks, and open space for transformative practices that build upon the ideas gathered here.

Bruna Galvão

Strategy director

Gabi Vuolo

Executive director

Luz González

Networks and partnerships director

Aurora Lab

VIEWS ON THE JUST ENERGY TRANSITION

JUST TRANSITION: THE VOICE OF THE WORKERS

Wellington Messias Damasceno

The ABC Metalworkers' Union reaffirms its commitment to building a just energy and technological transition that guarantees employment, rights, and sustainable development. This agenda has been central to our work, alongside the daily struggles for better wages, working conditions, and the preservation of the national industry. It's not just about discussing the future of the automotive sector or other segments of the economy, but about thinking about the future of the country, future generations, and all the workers who build Brazil's wealth.

We have insisted on defending industrial policies that preserve and strengthen the national productive base – especially in regions with mature industrialization – and result in job creation and improved income. We have already participated in important federal reindustrialization programs, such as *Inovar-Auto*, *Rota 2030*, and *Plano Brasil Maior*. These initiatives aimed to boost the industry, generate jobs, and promote economic development. We are currently living through a unique moment, marked by profound transformations: digitalization, Industry 4.0, new technologies, and, more recently, the global race for solutions to the climate crisis.

Our central concern is that this transition be just. We want a transition that considers workers at all stages, preserves the environment and jobs, promotes professional training, and protects their rights. What we have seen in many projects – precarious work, lack of social protection, wage stagnation, and even cases of slave-like labor – cannot be the model for the future. It is essential to ensure that the

changes in the energy matrix, production technologies, and forms of consumption do not result in social exclusion.

We advocate for modern reindustrialization, focused on decarbonization and sustainable development in three dimensions: environmental, economic, and social. It is necessary to balance the equation so that the financial aspect does not override the other dimensions. This means considering public policies that foster innovation and new technologies, while also ensuring the creation of quality jobs and respect for human rights.

Brazil has significant comparative advantages, including biofuels such as ethanol, biodiesel, biogas, and biomethane, among others, which already contribute to reducing emissions. A 1.0 ethanol car in Brazil can pollute less than an electric vehicle in Europe, whose energy matrix is thermoelectric. However, we recognize that the world is moving towards electrification, and we must adapt to this reality. It is necessary to adopt transitional solutions, such as hybrids, that allow us to gain time to retrain and include workers in the new world of work, reconvert companies, and prepare the country to compete in this new scenario.

The public policies we advocate must guarantee the maintenance and creation of jobs, increased income, professional qualifications, and retraining, as well as the expansion of the Brazilian industrial park and productive integration with Latin America, Asia, and Africa.

We cannot accept a transition that closes factories and transforms Brazil into a mere importer of technology. We need a reindustrialization strategy that diversifies transportation modes, encourages the use of electric vehicles, and promotes collective mobility solutions that reduce emissions and improve the quality of life in cities.

What we advocate for is inclusive development that strengthens the industry, generates quality jobs, reduces inequalities, and promotes the well-being of the Brazilian people. This is the contribution of the

ABC Metalworkers' Union to the debate on a Just Energy Transition – a call for the voices of workers to be heard and considered in building a sustainable future for the country.

***Wellington Messias Damasceno** is the administrative and financial director of the ABC Metalworkers' Union, a worker at Volkswagen in São Bernardo do Campo, Director of the Lula Institute, and representative of the World Workers' Committee of the Volkswagen Group. Wellington is also a lawyer and holds a postgraduate degree in Labor Law and Relations.*

ELECTRIFICATION OF THE TRANSPORTATION SECTOR: STRATEGIES FOR DECARBONIZATION AND JOB CREATION IN BRAZIL¹

André Cieplinski

Electric vehicles have become a fundamental technology for the global decarbonization of road transport, mainly due to their greater energy efficiency compared to combustion engines. Brazil is no exception. Considering emissions from fuel and electricity use and production, vehicle manufacturing, and battery production, it is estimated that, throughout its entire lifespan, an electric vehicle emits approximately 65% less greenhouse gases than a comparable flex-fuel combustion vehicle².

Therefore, the electrification of the transportation sector can play a key role in the transition to a low-carbon economy while promoting the modernization of the national automotive industry. However, this transformation does not occur in isolation and generates consequences in the labor market. A transition to electric vehicles presents challenges and opportunities, requiring the implementa-

1. A previous version of this article was published in Dialogues on Work and Climate (Aurora Lab, 2025).

2. Zamir Mera, Georg Bieker, Ana Beatriz Rebouças, and André Cieplinski, Comparison the life-cycle greenhouse gas emissions of combustion engine and electric passenger cars in Brazil, (The International Council on Clean Transportation, 2023), <https://theicct.org/publication/comparacao-das-emissoes-de-gee-ao-longo-do-ciclo-de-vida-de-motores-de-combustao-flex-e-eletricos-veiculos-de-passageiros-brasil-oct23/>

tion of strategic policies to maximize their economic and social benefits³.

One of the primary objectives of modern industrial policies is to foster the creation of high-quality jobs, often in the manufacturing sector⁴. Thus, the increased demand for electric vehicles must be linked to incentives for the development of a new production chain in Brazil, which includes not only the manufacture of vehicles, but also batteries and other essential components, such as electric motors. It is also vital to promote the expansion of charging infrastructure through investments in electricity transmission and distribution, as well as in the manufacture of the chargers themselves. Therefore, in addition to direct job opportunities in the manufacture of components and vehicles, there are also opportunities for job creation in the installation of charging networks, vehicle management, and maintenance. These opportunities also include jobs in software development, application development, and electric fleet management systems.

Domestic production of electric vehicles can also create opportunities to increase female participation in the automotive workforce. The development of a new electric vehicle industry can be more inclusive if policies and professional qualification programs aimed at including women in industrial, technical, scientific, and engineering service jobs are adopted from the outset.

3. André Cieplinski, The transition to electric vehicles in Brazil's automotive industry and its effects on jobs and income. (The International Council on Clean Transportation, 2025), <https://theicct.org/publication/a-transicao-da-industria-brasileira-para-veiculos-eletricos-e-seus-efeitos-em-emprego-e-renda-june25/>

4. Juhász, R., Lane, N., & Rodrik, D. (2023). The new economics of industrial policy. *Annual Review of Economics*, 16.

However, these opportunities are not guaranteed, and without a robust and timely set of industrial policies, Brazil risks becoming merely an importer of these technologies.

Advances in battery technology and production scale have contributed to a trend of decreasing electric vehicle prices in recent years. In the United States, it is estimated that price parity between battery-electric vehicles (with autonomy between 400 and 483 km) and combustion engine vehicles could be reached between 2027 and 2029.⁵ Combining price reductions with greater familiarity among Brazilian consumers, demand for electric vehicles in Brazil is likely to increase in the coming years gradually. Thus, the delay in developing a national production chain could lead to a substantial increase in vehicle imports, replacing combustion engine vehicles produced in Brazil.

The absence of a national electric vehicle industry could also affect Brazil's position as an exporter. Among the main consumer markets for Brazilian vehicles are Chile, Colombia, and Mexico, which have already established targets for electrification⁶. Therefore, domestic production of electric vehicles is also essential to

5. Peter Slowik, Aaron Isenstadt, Logan Pierce, and Stephanie Searle, Assessment of light-duty vehicle costs and consumer benefits in the United States in the 2022-2035 time frame, (The International Council on Clean Transportation, 2022), <https://theicct.org/publication/ev-cost-benefits-2035-oct22/>

strengthen Brazil's trade balance and reverse the downward trend in vehicle exports observed in the last two years⁷.

The development of an industrial strategy for the electrification of transport in Brazil has the potential to align the national ambition of achieving net-zero greenhouse gas emissions by 2050 with the creation of new, high-quality industrial jobs in the automotive sector. To this end, the implementation of public policies will be necessary, as well as the adoption of concrete measures by vehicle manufacturers capable of building a new, national, competitive, and sustainable industry.

***André Cieplinski** is a researcher at the International Council on Clean Transportation (ICCT) in Brazil. This text reflects the author's opinions and may not fully represent the position of ICCT Brazil.*

6. Barassa, E., Cruz, R. F., Bermúdez-Rodríguez, T., Chaves, A. F., Navarro, A. C. L., Consoni, F. & Tenure, T. M. P. (2022). Segundo anuário brasileiro da mobilidade elétrica: o Brasil em direção ao mix de tecnologias para descarbonização e digitalização dos transportes [Second Brazilian yearbook of electric mobility: Brazil towards a mix of technologies for decarbonization and digitalization of transport]. Available in Portuguese at: <https://www.pnme.org.br/biblioteca/2o-anuario-brasileiro-da-mobilidade-eletrica-pnme/>

7. André Cieplinski, Evolução recente do mercado brasileiro de veículos leves: a chegada de elétricos e híbridos (2021-2024) [Recent evolution of the Brazilian light vehicle market: the arrival of electric and hybrid vehicles (2021-2024)] (The International Council on Clean Transportation, 2024), Available in Portuguese at: <https://theicct.org/publication/evolucao-recente-do-mercado-brasileiro-de-veiculos-leves-a-chegada-de-eletricos-e-hibridos-2021-2024-dec24/>

THE CHALLENGES FOR A JUST AND POPULAR TRANSITION FROM A TRADE UNION PERSPECTIVE

Lucas Rogério de Andrade Lima, Luis Paulo Bresciani, Anna Paula Pinheiro, Silvana Martins de Miranda

The various transformations and transitions underway open up a wide field of disputes. For the working class, the debate on energy and technological transition is not just an environmental agenda, but also a class struggle agenda. The way this process is conducted will define whether the transition will be just or whether it will result in more inequality, precariousness, and exploitation of peripheral countries through neocolonialism.

What is at stake is industrial and energy sovereignty, the quality of jobs, and the role of workers as protagonists. The transition should not transform South America into a territory of devastation to sustain the consumption patterns and decarbonization of central countries, whether through rare earth mining or the installation of wind and solar farms that harm family farming and artisanal fishing in the Northeast. While Brazil obtains 84.8% of its energy from renewable sources, the global average is only 28.1%.

Strategic sectors need to be discussed responsibly and with the effective participation of communities and workers, so that it is possible to address energy and food poverty, for example, with national sovereignty, agrarian reform, and a decent income.

A just transition will only be possible with concrete policies. In this sense, the ABC Metalworkers Union has been working with a specific focus not only on the metallurgical industries in the region, but also on

the entire production chain. Based on an understanding of the need for national development based on reindustrialization, the Union has sought strategic public investments to promote innovation, digitalization, and decarbonization in industries, with a strong emphasis on the professional qualification and requalification of workers.

Proposals such as industrial reconversion – which supports companies in the search for new markets; fleet renewal – which encourages production and reduces emissions; as well as the construction of public policies – such as the *Nova Indústria Brasil*, *Combustível do Futuro* and *Mover* – point to the strengthening of the sector. These initiatives are fundamental to guaranteeing a transition based on social, environmental, and economic pillars.

Specifically regarding the automotive sector, we envision three possible scenarios for the transition: a qualified transition, technological stagnation, and global irrelevance. The defense is for a gradual and qualified transition, with different technological routes, valuing the national potential for ethanol, biofuels as a whole and, mainly, hybrids, in the face of the advancement of electrified vehicles, which, in addition to having low local content, use six times more mineral inputs and significantly reduce the components present in vehicles, directly affecting jobs.

The appreciation of collective bargaining is necessary. It is through agreements signed via union representation that protection mechanisms for workers are ensured, in addition to investments in industrial plants, which guarantee the future of operations. In this sense, it is crucial to acknowledge the pivotal role of workers in identifying priority sectors, creating new jobs, and mobilizing society.

Strengthening union representation has never been more necessary. DIEESE¹ points out that “green jobs,” generated in so-called sustaina-

1. DIEESE - Inter-Union Department of Statistics and Socio-Economic Studies

ble sectors, have meant fewer jobs, low wages, and loss of rights, that is, precarious jobs.

Workers have proposals and want to participate in the choices. The transition cannot be just a slogan taken to COP30: it needs to be a solid policy, capable of articulating reindustrialization, sustainability, and democracy in the world of work. The future we want is not one of exclusion, but one where workers and communities take a leading role in building a new development model, ensuring that the transition is, in fact, just and inclusive.

Lucas Rogério de Andrade Lima holds a degree in Sciences and Humanities and is a graduate student in Public Policy at the Federal University of ABC (UFABC). He is a technician at DIEESE in the ABC Metalworkers Union Subsection.

Luis Paulo Bresciani holds a PhD in Science and Technology Policy from the State University of Campinas (Unicamp). He is a professor in the Department of Public Management at FGV/EAESP. He was Executive Secretary of the Greater ABC Intermunicipal Consortium (2011/2016). Coordinator of the DIEESE Subsection of the ABC Metalworkers Union.

Anna Paula Pinheiro holds a degree in Economics from the Federal University of Latin American Integration (UNILA). She is a postgraduate student in Economics and Labor at the DIEESE School. She is a DIEESE technician at the ABC Metalworkers Union Subsection.

Silvana Martins de Miranda holds a degree in Psychology. She is an employee of the ABC Metalworkers' Union. In the DIEESE Subsection, he holds the position of research assistant.

PROPOSALS

PROPOSALS FROM THE METALWORKERS FOR A JUST ENERGY TRANSITION

1 INVEST IN SMALL AND MEDIUM-SIZED ENTERPRISES TO EMPOWER THEM AND ACHIEVE GREATER NATIONALIZATION OF FUTURE PRODUCTS.

Focusing on protecting the domestic labor market, guaranteeing jobs, fostering more technology in the country, and training better professionals.

2 PROMOTE TECHNOLOGICAL INNOVATION COMBINED WITH THE EXPLORATION OF BIOFUELS.

To maintain the production chain while ensuring environmental preservation, generating employment and income, and guaranteeing social development and increased quality of life.

3

IMPLEMENT TALENT DEVELOPMENT PROGRAMS AND INCENTIVES FOR ENERGY TRANSITION PROJECTS.

To value our talents and encourage them to preserve the environment, and generate new jobs, maintaining a skilled workforce internally, aiming for self-sufficiency in technologies.

4

IMPLEMENT FUNDAMENTAL CONTENT (RENEWABLE ENERGIES AND SUSTAINABILITY) IN SCHOOL CURRICULA.

At various times, workers have expressed concerns about incorporating the agenda into educational institutions.

5

PROMOTE THE EXCHANGE OF TECHNOLOGY BETWEEN COMPANIES AND UNIVERSITIES FOR THE DEVELOPMENT AND GROWTH OF THE RENEWABLE ENERGY SECTOR.

Through the sharing of information, training the workforce to work in the sector.

6

OFFER OPPORTUNITIES FOR TRAINING WORKERS IN THE SECTOR FOR NEW TECHNOLOGIES, IN PARTNERSHIP WITH COMPANIES AND UNIVERSITIES.

7

TRANSFORM THE PROPOSALS OF THE ENERGY TRANSITION (TRAINING, EMPLOYMENT, INCOME, HEALTH, AND ENVIRONMENT) INTO LAWS.

Thus, ensuring that the transition of power does not alter the rules and proposals discussed.

8

CREATE TAX INCENTIVES FOR COMPANIES IN EXCHANGE FOR TECHNOLOGICAL DEVELOPMENT AND NATIONAL PRODUCTION.

With electrification, a decrease in the number of vehicle components is expected. Nationalization can help create new jobs.



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ABC METALWORKERS' UNION

Moisés Selerges Júnior
Wellington Messias Damasceno

DIEESE - INTER-UNION DEPARTMENT OF STATISTICS AND SOCIO-ECONOMIC STUDIES

Lucas Rogério de Andrade Lima

INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION (ICCT BRASIL)

André Cieplinski

COLETIVO ENTRELINHAS

Victor Massao

INSTITUTO PROCOMUM

Niva da Silva
Vitor Marinho

LABS PARTICIPANTS:

André Cieplinski	Anderson Rodrigues de Almeida
Alessandro José da Silva	André Cieplinski
Aroaldo Oliveira da Silva	André Luis Alves Castello
Claudio dos Santos da Silva	Aurélio Camargo Lopes
Clayton Rodrigues de Oliveira	Carlos Eduardo
Crispiniano Alves Ramos	Célia
Danillo Vieira de Souza	Célio Bezerra Duarte
Fabio Roberto Feliciano Bezerra	Celso Ricardo de Moura
Felipe Israel Custodio da Silva	Charles Aurélio de Jesus Lima
Fernando Gomes da Silva	Cícero Alves de Brito Irmão
Francisco das Chagas Sarmento	Diego Goulart Santos Ribeiro
Francisco dos Santos	Edgar Martines de Campos
Jaqueline Felix Leão da Silva	Edimilson Pereira Gerônimo
Leandro Santana dos Santos	Emerson Monteiro da Silva
Maicon Divino Domiciano	Fabio Braga da Silva
Maria da Penha Bittencourt dos Santos	Hélio da Costa
Maria das Neves Oliveira	Leandro Bulhões Lemes
Marivaldo da Rocha	Leandro Soares de Sousa
Mayara Maciel Batista Siqueira	Luciano Rogério Garavelo
Pedro	Luis Paulo
Rosenildo Ronald Resende Torres	Márcio Aparecido Araujo
Samuel Cruz de Souza	Marco Antonio da Silva Cunha
Sandra Regina Conrado Silva	Mauricio Altino Fontes
Sandro Luis de Oliveira	Rafael Conti Gomes
Sidnei Carlos de Souza	Rodolfo de Castro Silva
Wesley Ricardo Aparecido de Sousa	Rodrigo Felipe do Nascimento
Airton José Coletto	Sebastião Arlindo Vieira
Alan Ricardo Tomaz da Silva	Tereza
Alexandre Silvério da Silva	Wilson da Silva Santos Soares
Anderson Chaves	

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CREDITS

Aurora Lab Team: Bruna Galvão, Carol La Terza, Gabi Vuolo, Guilherme Borducchi, Jaqueline Souza, Luz González, Raphael Maia, Rochelle Borges.

Translation and text review: Máisa Intelisano

Visual Identity: Coletivo Piu (Ana Dibiasi e Caco Wellichan)

Layout: Claudia Revoredo

Cover: Raphael Maia

Image credits: Paulo Pereira / Teia Documenta

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